

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

---

Nebraska Tractor Tests

Tractor Test and Power Museum, The Lester F.  
Larsen

---

2008

## Nebraska Summary: S737 Case-IH Farmall 105U

Nebraska Tractor Test Laboratory

University of Nebraska-Lincoln, tractortestlab@unl.edu

Follow this and additional works at: <https://digitalcommons.unl.edu/tractormuseumlit>



Part of the [Energy Systems Commons](#), [History of Science, Technology, and Medicine Commons](#), [Other Mechanical Engineering Commons](#), [Physical Sciences and Mathematics Commons](#), [Science and Mathematics Education Commons](#), and the [United States History Commons](#)

---

Laboratory, Nebraska Tractor Test, "Nebraska Summary: S737 Case-IH Farmall 105U" (2008). *Nebraska Tractor Tests*. 3230.

<https://digitalcommons.unl.edu/tractormuseumlit/3230>

This Article is brought to you for free and open access by the Tractor Test and Power Museum, The Lester F. Larsen at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Nebraska Tractor Tests by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

# SUMMARY OF OECD TESTS 2525 & 2526 — NEBRASKA SUMMARY 737

## CASE IH FARMALL 105U DIESEL

### 12 SPEED

#### POWER TAKE-OFF PERFORMANCE-2WD

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>					
<b>Rated Engine Speed (PTO speed—1017 rpm)</b>					
93.2 (69.5)	2299	5.93 (22.46)	0.446 (0.271)	15.72 (3.10)	
<b>Standard Power Take-off speed (999 rpm)</b>					
93.7 (69.9)	2259	5.90 (22.35)	0.441 (0.269)	15.88 (3.13)	
<b>Maximum Power (1 hour)</b>					
94.4 (70.4)	2198	5.83 (22.07)	0.433 (0.263)	16.19 (3.19)	

#### VARYING POWER AND FUEL CONSUMPTION

93.2 (69.5)	2299	5.93 (22.46)	0.446 (0.271)	15.72 (3.10)	Air temperature
84.8 (63.2)	2460	5.72 (21.65)	0.473 (0.288)	14.82 (2.92)	72°F (22°C)
64.4 (48.0)	2489	4.68 (17.73)	0.510 (0.310)	13.76 (2.71)	Relative humidity
43.3 (32.3)	2514	3.45 (13.04)	0.558 (0.339)	12.56 (2.47)	41%
21.9 (16.3)	2553	2.32 (8.80)	0.745 (0.453)	9.41 (1.85)	Barometer
--	2564	2.00 (7.57)	--	--	28.6" Hg (97.0 kPa)

Maximum torque -316.8 lb.-ft. (429.5 Nm) at 900 rpm  
 Maximum torque rise -48.7%  
 Torque rise at 1800 engine rpm -26%

#### POWER TAKE-OFF PERFORMANCE - FWA

Power HP (kW)	Crank shaft speed rpm	Gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Mean Atmospheric Conditions
<b>MAXIMUM POWER AND FUEL CONSUMPTION</b>					
<b>Rated Engine Speed (PTO speed—1017 rpm)</b>					
92.7 (69.1)	2299	6.15 (23.29)	0.465 (0.283)	15.06 (2.97)	
<b>Standard Power Take-off speed (1000 rpm)</b>					
93.8 (70.0)	2261	6.05 (22.90)	0.452 (0.275)	15.50 (3.05)	
<b>Maximum Power (1 hour)</b>					
94.7 (70.6)	2098	5.88 (22.24)	0.435 (0.264)	16.12 (3.18)	

#### VARYING POWER AND FUEL CONSUMPTION

92.7 (69.1)	2299	6.15 (23.29)	0.465 (0.283)	15.06 (2.97)	Air temperature
83.3 (62.1)	2435	5.91 (22.36)	0.496 (0.302)	14.10 (2.78)	64°F (18°C)
63.4 (47.3)	2467	4.96 (18.79)	0.548 (0.334)	12.78 (2.52)	Relative humidity
42.6 (31.8)	2485	3.86 (14.63)	0.635 (0.387)	11.03 (2.17)	59%
21.4 (16.0)	2514	2.78 (10.54)	0.912 (0.555)	7.69 (1.51)	Barometer
--	2544	2.05 (7.77)	--	--	29.0" Hg (98.3 kPa)

Maximum torque -319.1 lb.-ft. (432.6 Nm) at 999 rpm  
 Maximum torque rise -50.7%  
 Torque rise at 1800 engine rpm -27%

**Location of tests:** Istituto per le Macchine e Movimento Terra 73, Strada delle Cacce, 10135 Torino, Italy

**Dates of tests:** December 2008 to February 2009  
**Manufacturer:** CNH Italia SpA, Via Leone XIII, 160035, Jesi, Italy

**FUEL and OIL:** Fuel No. 2 Diesel **Specific gravity converted to 60°/60°F (15°/15°C)** 0.842 **Fuel weight** 7.01 lbs/gal (0.840 kg/l) **Oil** SAE 15W40 **API service classification** CH-4 **Transmission and hydraulic lubricant** Akcela Nexplore fluid **Front axle lubricant** Akcela Nexplore fluid

**ENGINE:** Make CNH Diesel **Type** four cylinder vertical with turbocharger and air to air intercooler **Serial No.** 574999 **Crankshaft** lengthwise **Rated engine speed** 2300 **Bore and stroke** 4.094" x 5.197" (104.0 mm x 132.0 mm) **Compression ratio** 17.0 to 1 **Displacement** 274 cu in (4485 ml) **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element **Muffler** underhood **Exhaust** vertical **Cooling medium temperature control** thermostat

**CHASSIS:** **Type** 2WD & front wheel assist **Serial No.** Z8JL07751 **Tread width** rear 56.3" (1430 mm) to 89.0" (2260 mm), front 2WD - 55.4" (1407 mm) to 85.6" (2175 mm), FWA-60.1" (1526 mm) to 70.3" (1786 mm) **Wheel base** 2WD - 92.2" (2342 mm), FWA - 92.5" (2350 mm) **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio **Nominal travel speeds mph(km/h)** first 1.16 (1.87) second 1.69 (2.72) third 2.44 (3.92) fourth 2.72 (4.37) fifth 3.49 (5.61) sixth 3.95 (6.35) seventh 5.69 (9.15) eighth 6.39 (10.28) ninth 8.15 (13.11) tenth 9.28 (14.94) eleventh 13.38 (21.54) twelfth 19.17 (30.85) reverse 1.14 (1.83), 1.65 (2.66), 2.39 (3.84), 2.66 (4.28), 3.42 (5.50), 3.87 (6.22), 5.57 (8.97), 6.26 (10.08), 7.98 (12.84), 9.10 (14.64), 13.12 (21.11), 18.79 (30.24) **Clutch** dual dry disc operated by foot pedal **Brakes** wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Power take-off** 540 rpm at 2198 engine rpm or 1000 rpm at 2261 engine rpm **Unladen tractor mass** 2WD - 8290 lbs (3760 kg), FWA - 9225 lb (4185 kg)

## FARMALL 105U - 2WD

(Unballasted)

### DRAWBAR PERFORMANCE

#### FUEL CONSUMPTION CHARACTERISTICS

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr (kg/kW.h)	Fuel Consumption Hp.hr/gal (kW.h/l)	Temp. °F (°C) cool- ing med	Air dry bulb	Barom. inch Hg (kPa)
<b>Maximum Power—7th (3 II) Gear</b>									
76.6 (57.1)	5275 (23.46)	5.44 (8.76)	2301	7.0	0.535 (0.326)	13.10 (2.58)	187 (86)	57 (14)	29.1 (98.6)
<b>75% of Pull at Maximum Power—7th (3 II) Gear</b>									
63.0 (47.0)	3955 (17.59)	5.97 (9.61)	2469	4.6	0.602 (0.366)	11.63 (2.29)	189 (87)	55 (13)	29.1 (98.6)
<b>50% of Pull at Maximum Power—7th (3 II) Gear</b>									
42.9 (32.0)	2640 (11.73)	6.10 (9.82)	2496	3.3	0.712 (0.433)	9.85 (1.94)	189 (87)	55 (13)	29.1 (98.6)
<b>75% of Pull at Reduced Engine Speed—8th (1 III) Gear</b>									
63.1 (47.0)	3955 (17.60)	5.98 (9.62)	2204	4.5	0.547 (0.333)	12.82 (2.53)	185 (85)	57 (14)	29.1 (98.6)
<b>50% of Pull at Reduced Engine Speed—8th (1 III) Gear</b>									
42.9 (32.0)	2645 (11.76)	6.09 (9.80)	2209	3.2	0.626 (0.381)	11.19 (2.20)	185 (85)	57 (14)	29.1 (98.6)

#### MAXIMUM POWER IN SELECTED GEARS

2nd(2 I) Gear									
28.8 (21.5)	6465 (28.75)	1.67 (2.69)	2517	14.1	0.819 (0.497)	8.58 (1.69)	189 (87)	50 (10)	29.1 (98.4)
3rd(3 I) Gear									
40.6 (30.3)	6360 (28.30)	2.40 (3.86)	2501	13.5	0.708 (0.431)	9.90 (1.95)	189 (87)	52 (11)	29.1 (98.4)
4th(1 II) Gear									
45.5 (33.9)	6355 (28.28)	2.68 (4.31)	2494	13.4	0.684 (0.416)	10.25 (2.02)	189 (87)	54 (12)	29.1 (98.4)
5th(4 I) Gear									
56.9 (42.4)	6285 (27.95)	3.39 (5.46)	2473	12.8	0.649 (0.395)	10.80 (2.13)	187 (86)	54 (12)	29.1 (98.4)
6th(2 II) Gear									
64.2 (47.9)	6250 (27.79)	3.85 (6.20)	2461	12.4	0.622 (0.378)	11.27 (2.22)	185 (85)	55 (13)	28.8 (97.4)
7th(3 II) Gear									
76.8 (57.3)	5490 (24.43)	5.25 (8.44)	2210	7.7	0.534 (0.325)	13.14 (2.59)	183 (84)	59 (15)	28.8 (97.4)
8th(1 III) Gear									
78.2 (58.3)	5205 (23.16)	5.63 (9.06)	2096	7.2	0.506 (0.308)	13.86 (2.73)	183 (84)	52 (11)	28.8 (97.4)
9th(4 II) Gear									
79.0 (58.9)	4290 (19.09)	6.90 (11.10)	1979	5.2	0.493 (0.300)	14.21 (2.80)	181 (83)	55 (13)	28.8 (97.4)
10th(2 III) Gear									
78.3 (58.4)	3720 (16.54)	7.90 (12.71)	1977	4.5	0.495 (0.301)	14.16 (2.79)	181 (83)	54 (12)	28.8 (97.4)

**REPAIRS AND ADJUSTMENTS:** No repairs or adjustments

**REMARKS:** All test results were determined from observed data obtained in accordance with official OECD test procedures. The performance results on this summary were taken from OECD tests conducted under the OECD Code 2 test procedure.

We, the undersigned, certify that this is a true summary of data from OECD Reports No. **2525** and **2526**, Nebraska summary 737, October 5, 2010.

Roger M. Hoy  
Director

M.F. Kocher  
D.R. Keshwani  
J.A. Smith  
Board of Tractor Test Engineers

## Famall 105U - 2WD

### TIRES AND WEIGHT

Rear tires—No., size, ply & psi (kPa)

Front tires—No., size, ply & psi (kPa)

Height of drawbar

Static weight with operator—Rear

– Front

– Total

### Tested without ballast

Two 600/65R34; \*\*; 12 (80)

Two 10:00-16; 8; 45 (310)

19.5 in (495 mm)

5535 lb (2510 kg)

2920 lb (1325 kg)

8455 lb (3835 kg)

**FARMALL 105U - FRONT WHEEL ASSIST**  
**(Unballasted - Front Drive Engaged)**  
**DRAWBAR PERFORMANCE**  
**FUEL CONSUMPTION CHARACTERISTICS**

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank- shaft speed rpm	Slip %	Fuel Consumption		Temp. °F (°C)		Barom. inch Hg (kPa)
					lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	cool- ing med	Air dry bulb	
<b>Maximum Power—7th (3 II) Gear</b>									
78.9 (58.8)	5270 (23.45)	5.61 (9.03)	2300	4.8	0.547 (0.333)	12.82 (2.53)	187 (86)	52 (11)	28.9 (97.9)
<b>75% of Pull at Maximum Power—7th (3 II) Gear</b>									
63.3 (47.2)	3955 (17.59)	6.01 (9.67)	2441	3.7	0.633 (0.385)	11.07 (2.18)	187 (86)	55 (13)	28.9 (97.9)
<b>50% of Pull at Maximum Power—7th (3 II) Gear</b>									
43.1 (32.1)	2635 (11.71)	6.14 (9.88)	2477	2.7	0.713 (0.434)	9.83 (1.94)	189 (87)	54 (12)	28.9 (97.9)
<b>75% of Pull at Reduced Engine Speed—8th (1 III) Gear</b>									
63.3 (47.2)	3950 (17.58)	6.01 (9.67)	2169	3.7	0.576 (0.351)	12.16 (2.40)	189 (87)	54 (12)	28.9 (97.9)
<b>50% of Pull at Reduced Engine Speed—8th (1 III) Gear</b>									
43.2 (32.2)	2635 (11.72)	6.14 (9.88)	2195	2.7	0.648 (0.394)	10.81 (2.13)	189 (87)	52 (11)	28.9 (97.9)

**MAXIMUM POWER IN SELECTED GEARS**

36.1 (26.9)	8275 (36.80)	1.64 (2.63)	2485	14.5	2nd(2 I) Gear 0.749 (0.456)		9.35 (1.84)	187 (86)	43 (6)	29.2 (99.0)
52.0 (38.8)	7945 (35.35)	2.45 (3.95)	2470	10.6	3rd(3 I) Gear 0.666 (0.405)		10.52 (2.07)	187 (86)	43 (6)	29.2 (99.0)
57.1 (42.6)	7880 (35.05)	2.72 (4.38)	2456	10.4	4th(1 II) Gear 0.645 (0.392)		10.87 (2.14)	187 (86)	41 (5)	29.2 (98.8)
71.2 (53.1)	7745 (34.46)	3.45 (5.55)	2428	9.8	5th(4 I) Gear 0.583 (0.354)		12.03 (2.37)	187 (86)	41 (5)	29.2 (98.8)
77.2 (57.6)	7550 (33.59)	3.83 (6.17)	2365	8.8	6th(2 II) Gear 0.537 (0.326)		13.06 (2.57)	189 (87)	43 (6)	29.1 (98.7)
80.7 (60.2)	6275 (27.92)	4.82 (7.76)	2005	5.8	7th(3 II) Gear 0.493 (0.300)		14.21 (2.80)	187 (86)	48 (9)	29.0 (98.3)
80.6 (60.1)	5390 (23.98)	5.61 (9.02)	2043	4.4	8th(1 III) Gear 0.496 (0.302)		14.11 (2.78)	187 (86)	52 (11)	29.1 (98.5)
79.1 (59.0)	4270 (19.00)	6.95 (11.18)	1977	4.0	9th(4 II) Gear 0.500 (0.304)		14.01 (2.76)	187 (86)	48 (9)	29.1 (98.4)
78.7 (58.7)	3995 (17.77)	7.39 (11.89)	1836	3.8	10th(2 III) Gear 0.485 (0.295)		14.47 (2.85)	189 (87)	45 (7)	29.1 (98.5)

**Famall 105U - Front Wheel Assist**

**TIRES AND WEIGHT**

**Rear tires**—No., size, ply & psi (kPa)  
**Front tires**—No., size, ply & psi (kPa)  
**Height of drawbar**  
**Static weight with operator**—Rear  
 — Front  
 — Total

**Tested without ballast**

Two 600/65R34; \*\*, 12 (80)  
 Two 480/65R24; \*\*, 12 (80)  
 19.5 in (495 mm)  
 5600 lb (2540 kg)  
 3790 lb (1720 kg)  
 9390 lb (4260 kg)

TRACTOR SOUND LEVEL WITH CAB	FWA dB(A)	2WD dB(A)
At no load in 6th (2 II) gear	79.3	79.3
Bystander	--	--

### HYDRAULIC PERFORMANCE

CATEGORY: II

Quick Attach: None

OECD Static test

Maximum force exerted through whole range:	4180 lbs (18.6 kN)
i) Sustained pressure with relief valve open:	2755 psi (190 bar)
ii) Pump delivery rate at minimum pressure:	17.7 GPM (67.1 l/min)
iii) Pump delivery rate at maximum	
hydraulic power:	15.4 GPM (58.4 l/min)
Delivery pressure:	2255 psi (155 bar)
Power:	20.3 hp (15.1 kW)

### HITCH DIMENSIONS AS TESTED—NO LOAD

	SAE TEST		OECD TEST	
	inch	mm	inch	mm
A	26.1	664	26.5	674
B	10.0	255	10.0	255
C	13.9	352	13.9	352
D	11.7	296	11.7	296
E	13.3	337	10.1	257
F	8.1	205	8.1	205
G	30.5	775	30.5	775
H	0.6	16	0.6	16
I	15.7	400	15.7	400
J	22.4	570	22.4	570
K	20.7	526	17.7	450
L	42.1	1070	42.1	1070
M	21.6	548	21.6	548
N	37.0	940	37.0	940
O	9.6	245	7.9	200
P	41.5	1053	46.5	1180
Q	42.1	1069	36.2	920
R	25.2	640	24.4	620

### THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed maximum pressure psi. (bar)	2900 (200)
Location:	remote outlets
Hydraulic oil temperature: °F (°C)	131 (55)
Location:	hydraulic sump
Category:	II
Quick attach:	none

System pressure 2610 psi (180 Bar)

Hitch point distance to ground level in. (mm)	9.7 (246)	16.5 (420)	22.4 (570)	28.3 (720)	36.2 (920)
Lift force on frame lb	9260	7935	7285	7170	6295
" " " " " " (kN)	(41.2)	(35.3)	(32.4)	(31.9)	(28.0)

